# Problem J. Joke

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|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 2 seconds |
| Memory limit: | 512 mebibytes |

Consider two permutations of integers from 1 to $n$: $p$ and $q$. Let us call a binary string $s$ of length $n$ *satisfying* if there exists a matrix $a$ with dimensions $2 \times n$ such that:

- Every integer from 1 to $2n$ appears exactly once in the matrix.
- The elements in the first row are ordered correspondingly to permutation $p$. More formally, $a_{1,i} < a_{1,j} \iff p_i < p_j$ for $1 \le i < j \le n$.
- The elements in the second row are ordered correspondingly to permutation $q$. More formally, $a_{2,i} < a_{2,j} \iff q_i < q_j$ for $1 \le i < j \le n$.
- For every $i$ from 1 to $n$, we have $a_{1,i} < a_{2,i} \iff s_i = 0$.

For two permutations $p$ and $q$ of size $n$, let us define $f(p, q)$ as the number of satisfying strings $s$ for them.

You are given all elements of $p$, and several elements of $q$, but forgot others. Find the sum of $f(p, q)$ over all permutations $q$ with the given known elements, modulo 998 244 353.

## Input

The first line of the input contains a single integer $n$ ($1 \le n \le 100$).

The second line of the input contains $n$ integers $p_1, p_2, \ldots, p_n$ ($1 \le p_i \le n$, all $p_i$ are distinct), a permutation of numbers from 1 to $n$.

The second line of the input contains $n$ integers $q_1, q_2, \ldots, q_n$ ($0 \le q_i \le n$, $q_i \ne q_j$ when $q_i \ne 0$ and $q_j \ne 0$). If $q_i \ne 0$, the respective element is given. If $q_i = 0$, its value is forgotten. All given elements are distinct.

## Output

Output the sum of $f(p, q)$ over all valid permutations $q$ modulo 998 244 353.

## Examples

| standard input | standard output |
|---|---|
| 2<br>1 2<br>2 1 | 3 |
| 4<br>4 3 2 1<br>4 3 2 1 | 16 |
| 5<br>1 2 3 4 5<br>0 0 0 0 0 | 1546 |
| 6<br>1 6 2 5 3 4<br>0 1 0 2 0 3 | 52 |